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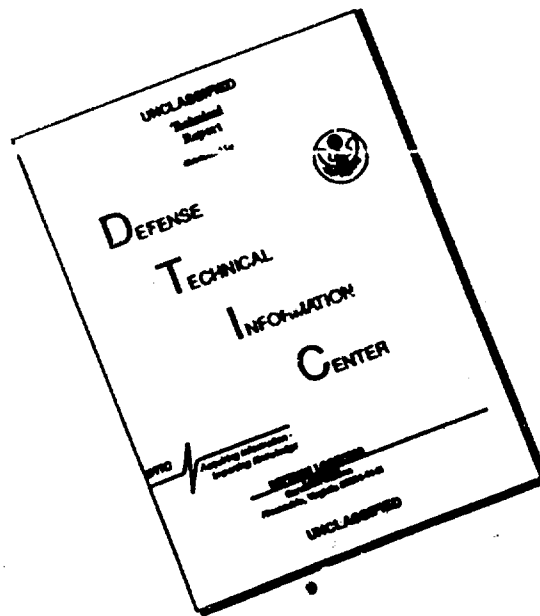
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The Opsono-Phagocytic Reaction in Listerellosis in Swine.

by M. I. Iashenkina - from the laboratory engaged in the study of the diseases of swine, VIEV (All-Union Institute of Experimental Veterinary Medicine) Scientific Supervisor - Professor P. S. Solomkin.

Collected Works All-Union Institute of Experimental Veterinary Medicine
pp. 106-108: 1957

The opsono-phagocytic reaction was and is used as a method of early diagnosis of some infectious diseases of animals and humans.

Large works have been conducted by numerous investigators on the subject of the opsono-phagocytic reaction in brucellosis, in swine erysipelas, glanders, typhus abdominalis, croupous pneumonia, angina, scarlatina, diphtheria, gonorrhea and leprosy.

It is not impossible that in listerellosis, as well as in several other infectious diseases, with the help of the opsono-phagocytic reaction one may clear up the question concerning the immunobiological condition of an organism.

We took for the work, strains of listeria isolated at various times from gilts. First we investigated them bacteriologically and biologically on experimental animals and in an homoagglutination reaction with erythrocytes of a ram and a rooster.

As a result of the investigation we selected 5 strains of listeria: Nos. X₁, X₂, 4, 6, 15, which we also used in the experiment.

We injected a washing of a 24-hour agar culture of listeria in a physiological solution of strain No. X₁ in increasing doses into rabbits. After a six-fold intramuscular injection of strain No. X₁, blood was taken from the animals within 5, 10, 20 and 30 days.

We arranged the opsono-phagocytic reaction by the following well known method. A 24-hour agar culture of listeria No. X₁ was washed with a two-percent solution of sodium citrate in a physiological solution of sodium chloride and reduced to 2 milliard bacterial bodies. 0.5 ml of such a suspension was taken in a bacteriological test tube, 0.25 ml of a 20-percent solution of sodium citrate was added, and after that - 0.5-1 ml of blood from the animal being tested. The blood was added along the sides of the test tube and was agitated carefully and evenly; afterwards the test tubes were placed for 30 minutes into a water bath at a temperature of 37°C. After the 30 minutes a smear was prepared, which was fixed with methyl alcohol (three minutes) and stained by the Gimsa* method.

The phagocytic index of the microbic bodies in the arrangement of the reaction with the blood taken 5 days after the last injection of the culture reached 15 %, with the blood taken 10 days after injection - 20 %, and after 28 days - 28 % and after 30 days - 40 %. Later the rabbits were dehematized in order to receive from them hyperimmune serum, which we also used in an agglutination reaction. Analogous experiments were conducted with the hyperimmunization of

~~Analogous experiments were conducted with the hyperimmunisation of rabbits with the aid of strain No. X₂. Upon taking the blood after the sixth (last) injection we noted the following phagocytic index: after 5 days - 10 %, after 10 - 15 %, after 20 - 15 % and after 30 days - 20 %.~~

In the third experiment we immunized the rabbits with a broth culture a mixture of listerellal strains Nos. 4, 6 and 15. We combined 24-hour-old broth cultures of these strains prior to the injection. First the rabbits were immunized with an injection of the culture given subcutaneously, and afterwards, intravenously. The phagocytic index of the blood taken after the last injection of the culture reached: after 5 days - 20 %, after 10 days - 23 %, after 20 days - 32 % and after 30 days - 48 %.

In the investigation of the blood from the control animals (not immunized) the phagocytosis did not exceed 4-6 %.

We also immunized a group of guinea pigs and made a subsequent test of their blood by the phagocytic reaction. We subcutaneously injected an agar culture of listeria (strain No. X₂) into the guinea pigs in increasing doses with 5-6 day intervals between injections. We staged the reaction with the guinea pigs' blood within 15-30 days after the last injection. The phagocytosis of the microbial bodies by the leukocytes is expressed in the following figures: after 15 days - 18 %, after 30 days - 58 %.

Apart from the rabbits and guinea pigs, we also arranged experiments on white mice. 20 mice were included in the experiment. They were infected subcutaneously with a single injection of a culture of listeria, strain No. X₁, in a dose of 0.4 ml each. Twenty five percent of the mice died from listerellosis on the 6th-9th day. From those remaining, blood was taken within 15 days after the injection of the culture. The phagocytic index composed 50 %.

We also investigated the opsono-phagocytic reaction with gilts and sheep. We conducted the experiments on the gilts and sheep in order to receive hyper-immune serum from them, and for a check of the phagocytic index. Prior to the start of the experiments on these animals we took blood from them two times, and in neither case was phagocytosis noted. A culture from the strains Nos. X₁, X₂, 4, 6 and 15 was injected into the animals, 8-9 times each, with 5 to 7 day intervals. Within 5, 10, 20 and 30 days after the 9 injections blood was taken from the animals and checked in the opsono-phagocytic reaction. Phagocytosis was noticed neither with the gilts' blood nor with the sheep blood.

An analogous result was received in a check for phagocytosis in the blood of gilts known to be ill with red fever.

We also checked the serum received from the rabbits after their hyper-immunisation, in an agglutination reaction for its preventative properties. Of the ten sera received from the rabbits, two proved to be active. The sera taken from the gilts and sheep proved to be active. The survival percentage of the white mice was 60 %, with 100 % lethality for the control.

Conclusions

1. With an injection of a culture of listeria into rabbits or guinea pigs, the phagocytic properties of their blood is increased in relation to the pathogen of listerellosis in swine.
2. The blood of the gilts and sheep used in the experiment did not possess phagocytic properties in relation to listeria.
3. Our experiments showed that the opsono-phagocytic reaction cannot be used for diagnostic purposes in listerellosis of swine.

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Translator's Note

- * - indicates a name that is transliterated directly from the Russian text.